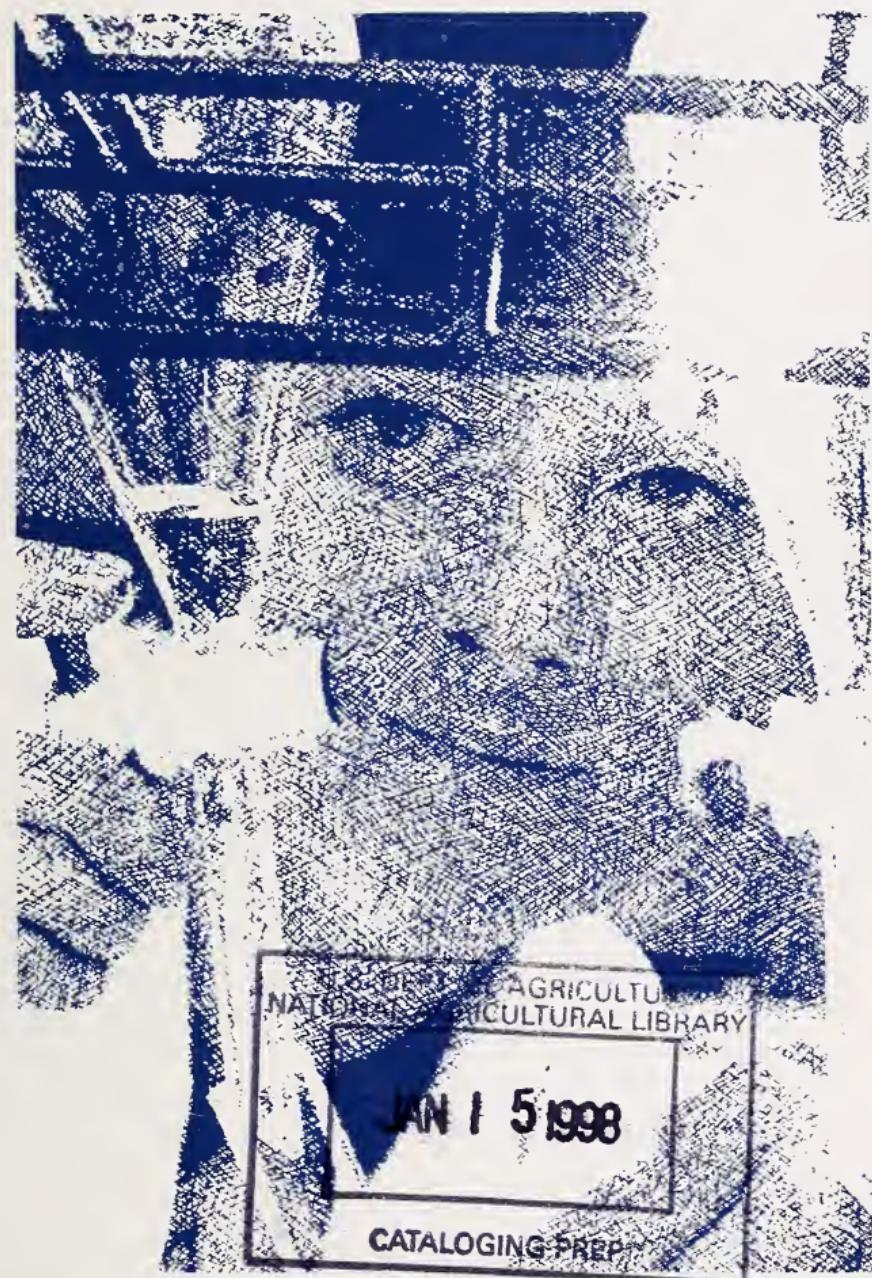


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Agricultural research has some of the most challenging and important assignments in the realm of science today. In this time of diminished crop reserves, with populations growing at a rate that threatens to outstrip the world's food supply, there is a need, as never before, for plentiful stocks of high-quality food, feed grains, animal and vegetable protein, and other essential products. Agricultural scientists are striving to fulfill this need with new technology that will increase our production capability. They are involved in areas of high national priority such as environmental protection, conservation, food safety and quality, and new sources of energy.

WHAT IS AGRICULTURAL RESEARCH?

- It is a means of gaining and applying knowledge to the economical production, processing, utilization, and marketing of farm and ranch products.
- It is a means of keeping agricultural products plentiful and their costs down.
- It is a search into such basic national interests as human nutrition, rural development, the conservation and wise use of natural resources, and the protection of man's environment.
- It is a contribution that has brought major benefits to consumers, as well as to farmers.

Agricultural research is also involved in extending the frontiers of knowledge in the life and physical sciences.

RECENT ADVANCES OF AGRICULTURAL RESEARCH

- *Building in more protein.*—Researchers are working to increase the content and quality of protein found in edible plants—particularly in the cereal grains. High-lysine corn—corn that contains a higher amount of nutritionally valuable amino acid — and two new oat vari-

ties now grown commercially are examples of this research contribution.

They have also developed a dry-bean breeding line that contains 30 percent more protein. Research now underway includes an edible protein concentrate from alfalfa and the production of 3 new breeding lines of high-protein red winter wheat.

• *Increasing beef production.*—Researchers are conducting broad programs to increase beef production in the United States. These programs involve breeding, production efficiency, feeding, management, and the improvement of pasture, range, and forage production.

One example of the way beef production is being stepped up is the use of hormone injections to increase multiple births in beef cows. Scientists found this technique resulted in a striking increase over the normal one to four percent twinning rate in beef herds.

• *Protecting forage crops.*—Researchers are striving to incorporate disease resistance in



0671K700-7

An ARS nutrition scientist feeds a laboratory rat in research aimed at learning how the liver synthesizes fat from carbohydrates—information that may be related to coronary health in man.



1072X-1411-1

New foods are developed by ARS researchers to provide hungry peoples of the world with food to prevent starvation and malnutrition. Here, extrusion-cooked cornmeal piles up for use in instant CSM (corn-soy-milk concentrate)—a high-protein food that is a staple for many malnourished infants and children in developing countries.

forage crops. They have developed a new variety of alfalfa named Arc that is particularly resistant to anthracnose, a fungus disease that damages more than 4 million acres of alfalfa annually. Widespread use of Arc could increase the value of the Nation's number one forage crop by more than \$200 million annually.

- *Eliminating plant pests.*—Researchers are pioneering biological and other new ways of controlling pests, and ways of combining control techniques into integrated pest control concepts.

One example is the integrated program designed to eliminate the boll weevil as an economic threat to cotton. In this program, scientists have combined the following methods into one suppression system: use of timely insecticide applications; cultural control; use of pheromones, a chemical attractant used to bait traps; and use of sexually sterile male weevils. This combination of techniques will make it technically and operationally feasible to eliminate this destructive pest, and accomplish it in a way that is ecologically acceptable.

- *Recycling potential pollutants.*—Researchers are finding new methods of recycling food processing wastes. Whey, a cheese byproduct, is now used to improve the nutritional value of foods; and brine, the principal waste product from olive and pickle processing plants, can be reclaimed and reused. As usable products, these wastes are thus canceled out as potential pollutants.

- *Improving processing methods.*—Researchers are finding new ways to improve fruit and



1173W1686-26

An agronomist inspects mid-November growth of love-grass—one of several grasses being tested for forage. Improvement of the quality of forage will increase yearly per acre beef production.



1173W1696-12

An agricultural research physiologist injects the hormone progesterone into a heifer. When this hormone is withdrawn most cows respond by ovulating. Estrus control of cattle will allow beef producers to increase conception rates in their cow herds.

vegetable processing. One cooperative study by ARS scientists involves the development of an unconventional potato chip—one that is made with the peel left on. They found that chips from unpeeled potatoes eliminate a processing step, alleviate waste disposal problem, lower consumer costs, and may prove to be more nutritious.

• *Evaluating nutrition data.*—Researchers in consumer and food economics continually evaluate data on the composition and nutritive value of foods. They constantly revise tables of food composition that take into account the effects of changing processing methods. Information from these revised tables of food compo-

sition, indispensable to dieticians, teachers, and members of the medical profession, will be used to establish a computerized data bank that will be a quick and reliable source of food value information.

- *Finding better means of transport.*—Researchers are finding ways to better transport food to the consumer. They have developed a prototype van container—a trailer “reefer” without wheels—that is zoned to permit different temperatures in different parts of the van. Food in the van need not be disturbed from the time it is loaded until it arrives at its final destination.

- *Refining Space-Age techniques.*—Researchers are employing highly sophisticated remote sensing techniques — photography, electronic, and computerized aircraft and space satellite systems—to better understand and determine crop, soil, and water conditions.

In the recent past, ARS researchers have provided such convenience products to consumers as frozen fruit juice concentrates, instant mashed potatoes, wash-wear cotton, and machine-washable wool.

PERFORMING THE JOB OF AGRICULTURAL RESEARCH

The job of agricultural research is carried out through a working partnership by Federal and State agencies and industry-supported organizations concerned with agriculture.

Agricultural research blazed the trail in co-operation between Federal and State governments, beginning in 1887 when federally-supported agricultural experiment stations were set up at land-grant colleges. A high proportion of the research of the Agricultural Research Service (ARS) is now cooperative with State agricultural experiment stations, and other organizations.

Federal and State research stations are dis-

persed widely to help solve the varying geographical problems of regions and States. Agricultural research scientists must cope with the great diversity of soils, crops, native vegetation, and climate that exist in the United States. Decisions on what research should be done at each station are based on consensus and cooperation.

Aside from research in Federal laboratories and at State agricultural experiment stations, agricultural research is coordinated with and conducted by private industry.

THE AGRICULTURAL RESEARCH SERVICE (ARS)

The Agricultural Research Service is a principal research agency of the U. S. Department of Agriculture. Its research assists agriculture and affects the well-being of all American citizens.

The agency conducts a diversified national research effort to provide farmers with better ways to grow and market their products, and consumers with an abundant and varied supply of food and fiber. On the international front, the agency provides foreign countries with both agricultural knowledge and improved agricultural products.

Nearly 8,000 people are employed by ARS on a full-time basis. Approximately 2,700 of these employees are scientists and engineers. Most of the employees are located at field research stations, experimental farms, and laboratories throughout the United States.

ORGANIZATIONAL STRUCTURE

The Administrator of the Agricultural Research Service is responsible for maintaining a national program for agricultural research that will meet the needs of American farmers and consumers. ARS also serves the research needs of the action and regulatory agencies of the Department of Agriculture.

In the overall leadership and direction of programs and activities, the Administrator is assisted by an Associate Administrator, five Deputy Administrators, and four Assistant Administrators. The Agricultural Research Service is organized into four regions; Deputy Administrators are responsible for providing programs and administrative management of ARS programs within their assigned regions.

At headquarters in Washington, D.C., the National Program Staff provides national scientific leadership and coordination of the research by commodity, discipline, and program areas. The four Assistant Administrators on this staff assist the Administrator in establishing long-range research goals and objectives, and in developing overall national research plans.

The National Program Staff also provides technical advice and assistance to scientists and program managers at all levels in ARS.

The Program Analysis and Coordination Staff participates with the National Program Staff and the Deputy Administrators in establishing policy and developing all aspects of



0874X1423-20

Cucumbers pour from the conveyor belt of a mechanical harvester in Michigan. This harvester, adapted to a standard tractor and developed by agricultural engineers, can harvest more than 200 bushels of cucumbers per hour.

national planning, evaluation, budgeting, and coordination.

Also at headquarters, a fifth Deputy Administrator has the responsibility for efficient utilization of funds and personnel in the Agency's administrative management divisions and staff.

The Director of the International Programs Division formulates policies for, and provides leadership to, ARS programs related to international agriculture.

Headquarters staff numbers approximately 500 employees.

RESEARCH PROGRAMS

The ARS program is directed to providing new knowledge and technology in six major areas of agricultural research. Each of these includes basic and applied research directed toward developing new technologies needed to keep U.S. agriculture efficient and competitive both at home and in world trade.

The six areas of research are directed toward: Increasing farm production efficiency; reducing the cost of marketing agricultural products and developing new and improved existing products and processes; improving the environment and developing effective use of natural resources; reducing food-related health hazards and improving family living; providing new knowledge of human requirements for nutrients to maintain good health as well as sources of these nutrients in food; and developing foreign agriculture and markets.

- *Farm production efficiency.*—The research objectives in this area include: The discovery, development, testing, and production of crops and livestock with improved genetic, physiological, and nutritional yield characteristics; the worldwide collection and preservation of valuable germplasm stocks; the protection of



0374A336-33

In this modern poultry house, 19,000 broilers live under one roof. Agricultural research in genetics, nutrition, new management practices, and disease control have all contributed to the rapid growth of the poultry industry over the past few decades.

plants and animals from environmental stress factors; and the development of improved and effective insect, weed, and disease controls, including safe pesticidal and alternative methods of pest control.

Other research objectives include the development of improved machinery and equipment; development of improved energy-efficient systems of production; translation of new technologies into effective management practices; and the creation of new or improved systems to increase farm productivity.

- *Marketing agricultural products.*—The research objectives in this area include: The conducting of studies on the performance of marketing systems for agricultural products, on the improvement of grades and standards of agricultural products, and on quality maintenance and pest control during storage and shipment.

Research is also conducted to develop new

food products having high protein content, as well as new and improved animal feeds, textile products, and industrial products from crops and livestock. Research is conducted to reduce water and energy consumption in processing, transportation, and marketing, and to reduce pollution from processing agricultural commodities.

- *Improving the environment.*—Research objectives concern the development and improvement of systems of soil and water management; the maintenance and improvement of soil tillage and fertility; the stabilization of stream channel flows; the prevention of pollution by wind, water, pesticide residues, and chemical pollutants from industrial sources. Increased emphasis is given to reclamation and revegetation of strip mines, control of non-point sources of pollution, and plant tolerance to pollution, droughts, and salinity.

- *Food safety and effective use of natural resources.*—This research effort involves chemical, biological, and engineering studies aimed at the prevention and removal of mold toxin, chemical residues, and potentially hazardous contaminants in food products. Research is conducted on insects which attack man, and on environmental quality in textile plants.

- *Human nutrition.*—The research objectives include providing new knowledge of human requirements for nutrients for the maintenance of good health, and sources of these nutrients in food.

Research is conducted to identify nutrient requirements by age and other categories, on sources of nutrients in individual food supplies and how these are affected by household and institutional handling, and on current food consumption and dietary situations.

- *Foreign Agriculture.*—The research in this area involves multilateral programs which benefit the science and technology of world agriculture, and improve foreign markets for U.S. agricultural products.

The Foreign Agricultural Research Grant Program originated in 1958 under authority of U.S. Public Law 480. Grants are made to colleges, universities, research institutes, and other agencies organized to conduct research. Grants are financed with local currencies, are issued to an institution, not an individual, and must be accepted by an authorized representative of the grantee institution or the foreign government. At the present time, funds are made available for new grants only in countries designated by the Treasury Department as having excess currency.

Under Section 406 of the Food for Peace Act, the Department of Agriculture is also authorized to conduct research and training in tropical and subtropical agriculture. The purpose of this program is to improve production and quality of tropical food products. A network for research and training strongly involves tropical locations at the University of Hawaii and University of Puerto Rico, plus other land grant colleges and universities, as well as ARS stations.

RESEARCH

The Agricultural Research Service is organized into four regions: Northeastern, North Central, Southern, and Western. Regional Deputy Administrators are responsible for providing program and administrative management of ARS programs within their assigned regions.

The Regional Deputy Administrators operate under broad delegations of authority and responsibility for the Administrator and carry out program activities through Area Directors. The Area Directors are program managers with responsibility for line supervision over research programs in assigned geographic areas within the regions.

Within each area, location leaders serve as a focal point, and as the principal ARS contact with State agricultural experiment station



0673A1110-16

The wasp parasite, *Coccogomimus*, deposits an egg in a gypsy moth pupa. ARS entomologists are fighting this pest that defoliates millions of acres of trees each year with its natural enemies—tiny wasps and parasitic flies imported from Asia and Europe that are harmless to man, animals, and plants.

directors, department heads, and industry groups on general location matters. Research leaders provide line technical supervision in an assigned research area at a location.

For a more complete depiction of research sites, see Regional Organization map.

NORTHEASTERN REGION

The ARS Northeastern Region headquarters is located in Beltsville, Md., and serves the 12 Northeastern States and the District of Columbia. The Region is divided into two areas with more than 2300 scientists and support staff at 21 locations.

Three major research facilities located in the Northeastern Region are the Agricultural Research Center, the Eastern Regional Research Center, and the Plum Island Animal Disease Center.

• The *Agricultural Research Center* at Beltsville, Md., is a dynamic complex of research activity that has made important contributions to American agriculture. The Center, site of

the Northeastern Regional Office, is situated 15 miles northeast of Washington, D.C., and covers about 10,000 acres, divided into experimental pastures, orchards, gardens, fields, and woods. Established in 1910, the Center is a highly diversified research complex.

The following research areas are highlighted at the Center: plant genetics and germplasm; agricultural marketing; nutrition; agricultural environmental quality; plant physiology; animal parasitology; insect identification and beneficial insect introduction; and plant protection.

Within the last several years, increasing concern over environmental quality has led to new research endeavors at the Center—research to insure prevention of pollution of soil, water, air, and plants in both rural and urban areas.

Established near the Center is the National Agricultural Library, one of three national libraries in the United States, and the most modern library facility in the world that specializes in agriculture. The library is engaged in a long-range information retrieval system and currently houses over 1.5 million volumes.

- The *Eastern Regional Research Center*, Wyndmoor, Pa., located in the Northeastern Region, is one of five regional research centers where research work on agricultural commodities is carried out. At this Center, a complex of six laboratories is involved in basic and applied research in chemistry, chemical engineering, microbiology, and food technology.

Research at the Center is concerned with the processing, treatment, storage, and handling of milk, meat, animal hides, animal fats, fruits, vegetables, and maple sap. This work is aimed at improving the quality and economy of consumer products made from these farm commodities. Some research objectives are to make possible more nutritious, convenient, and safer foods, more attractive and economical leathers, and new products for home industry from beef tallow.

- *Plum Island Animal Disease Center*, located on an island off the coast of Long Island, N.Y., is the nation's research center for the study of contagious foreign animal diseases.

Here, ARS scientists are developing the capability of diagnosis for animal diseases that do not exist in the United States; conducting basic and applied research on foreign animal diseases and their causative organisms; and developing adequate procedures so that foreign, domesticated, wild animals, and other animal products, may be imported safely.

The main objective of this facility is to prevent the introduction and spread of exotic animal diseases that could result in high death tolls or serious economic losses in our susceptible livestock population.

SOUTHERN REGION

The ARS Southern Region headquarters is located in New Orleans, La., and serves 13 States plus Puerto Rico and the U.S. Virgin Islands. The Region is divided into 8 areas with more than 2300 scientists and support staff at 66 locations.

- The *Southern Regional Research Center*, New Orleans, La., a major research facility in the Southern Region, emphasizes research in new and improved uses of the South's agricultural crops. Major crops now under study are cotton, cottonseed, peanuts, rice, sweetpotatoes, and sugar.

One research project at the Center is aimed at a new cotton processing system that may eliminate more than half the steps now necessary to produce woven or knitted textiles. Concern with safety, both in the home and in industry, led to the development at the Center of chemical treatments that render cotton fabric fire retardant. Scientists at this Center also developed several chemical processes that make cotton wrinkle-free and therefore eliminate ironing.

The world today is hungry for protein. Several recent Southern Regional Research Center developments have lead to the production of a high-protein edible flour from cottonseed. This new source of protein, pound for pound, contains more than five times the protein in wheat flour and more than three times the protein found in meat.

• The *Richard B. Russell Research Center*, Athens, Ga., is divided into eight research laboratories. There are four commodity groups and four support laboratories. The four commodity laboratories are Fruits and Vegetables; Animal



BN-42131

Researcher examines variety of high-protein, high-lysine wheat. ARS and cooperating State experiment station scientists have provided commercial wheat breeders with breeding lines and varieties that contain 13 to 14 percent protein.

Products; Feeds, Forages and Oilseeds; and Tobacco. The support laboratories are Engineering, Pharmacology, Biochemistry, and Product Evaluation.

Research emphasizes studies on crops important to the Southeastern region of the United States. These include fruits, vegetables, and tree nuts; animal products, with particular emphasis on poultry products and pork; feeds, forages and oilseeds, particularly the Southeastern grasses, Coastal bermuda, bahia and pangola; and sunflower, peanuts, and other Southeastern oilseeds; and tobacco.

A strong federal-state cooperative effort exists for solving agricultural problems of the region.

- *USDA Sedimentation Laboratory* Oxford, Miss., conducts fundamental research in erosion, sediment yield, sediment transport, sediment deposition, and the chemical properties of sediment on upland stream channels and reservoirs.

- At *College Station*, Texas, laboratories are devoted to research in brush control; diseases of cotton; improved methods of controlling insects that attack cotton; crop genetic studies on cotton, grasses, peanuts, and sorghum; market quality; transportation and facilities; and veterinary toxicology and entomology.

- The *U.S. Delta States Agricultural Research Complex*, Stoneville, Miss., is comprised of six major laboratories. The laboratories are Bioenvironmental Insect Control Laboratory; Cotton Physiology Laboratory; Southern Weed Science Laboratory; Field Crops Mechanization Unit; Soybean Production Laboratory; and U.S. Cotton Ginning Laboratory.

The Center works closely with the State Agricultural Experiment Stations, especially with the Mississippi Agricultural and Forestry Experiment Station, in maintaining complementary research programs.

Studies are conducted on insect problems that will avoid or minimize the use of insecti-

cides; insect-resistant soybeans; different strains of cotton; hard-to-kill weeds in the South; and methods of reducing costs and increasing efficiency in growing and harvesting cotton, soybeans, and other row crops. Other research includes studies of higher-yielding varieties of soybeans that are resistant to disease and nematodes; methods to reduce the cost of cotton products to consumers; and ways to improve methods of cotton cleaning, ginning, packaging, storing and waste disposal.

NORTH CENTRAL REGION

The ARS North Central Region headquarters is located in Peoria, Ill., and serves 13 States including Alaska. The Region is divided into five areas with more than 1500 scientists and support staff at 31 locations.

- The *Northern Regional Research Laboratory*, Peoria, Ill., conducts research on corn, wheat, grain, sorghum, and other cereal grains; soybeans, flaxseed, and other oilseed crops; and new crops. Some of the research contributions from this laboratory have opened new and expanded outlets for farm products, and several developments have provided the foundation for new or expanded industries.

Some of the cereal crop developments have been high-amylase corn; a wheat straw pulp used for blending in paper and fiberboard; and a batter process to produce starch and gluten from wheat flour.

Research in oilseed crops has resulted in linseed oil emulsion paints and new methods for curing concrete. Meal products research has resulted in improved export value of soybeans as well as adhesives for paper shotgun shells. New crop development has resulted in Crambe, an introduced plant producing seed that gives a new oil useful as a lubricant in the casting of steel, and Kenaf, an annual fiber plant converted to good chemical pulp for papermaking.

• *The National Animal Disease Center at Ames, Iowa, is a major research center devoted to the study of livestock diseases in the United States.*

Diseases studied at this Center have national significance or cause serious economic losses. Research projects include the following diseases of cattle: Brucellosis, foot rot, enteric diseases (virus diarrhea), infertility and vibriosis, leptospirosis, mastitis, pinkeye (infectious keratitis), respiratory diseases (shipping fever), tuberculosis, and para tuberculosis.

• *The U.S. Meat Animal Research Center, Clay Center, Nebr., is developing new technology for use by the meat animal industries to increase the production of high-quality red meat per unit of production resource use. Facilities at the 35,000-acre Research Center provide for both intensive laboratory investigations and field studies on beef cattle, sheep, and swine production.*

The comprehensive multidiscipline research program includes investigations on genetics and breeding, nutrition, meat technology, life cycle management systems, animal housing and facilities, waste management, as well as producing, harvesting, handling, storing, processing, and using feeds.

Research projects in the genetics and breeding of beef cattle seek to determine the optimum performance capability for different feed environments and production situations. The cattle germ plasm evaluation program at the Center is designed to study economic traits of breed groups that represent different biological types. The program was begun in 1969 and now is in its second cycle. Scientists are investigating the full spectrum of economic traits—such as growth rate, milk level, shape of growth curve, and composition of gain.

• *The U.S. Grain Marketing Research Center, Manhattan, Kansas, studies grain from harvest to storage to processing. Research emphasizes maximizing nutritional value, con-*

sumer acceptance, and technological versatility while minimizing energy requirements and maintaining soundness and overall quality during handling, conditioning, and storage. Major research concerns wheat, sorghum, and corn; other investigations include rice, barley, oats, soybeans, and triticale.

The research units in the laboratory include: (1) grain handling, conditioning, and storage; (2) grain quality and instrumentation; (3) hard winter wheat quality; (4) stored products insects; and (5) economics of grain handling (handled by the Economic Research Service). In addition, one unit engages in investigations on chemical and structural characteristics of grain that relate to market quality research conducted at the Center.

WESTERN REGION

The ARS Western Region headquarters is located in Berkeley, Calif., and serves 12 Western States including Hawaii. The Region is divided into five areas with more than 1300 scientists and support staff at 40 locations.

- The *Western Regional Research Center*, Berkeley, Calif., a major research center in the Western Region, directs its basic and applied research toward the following objectives—better utilization of farm commodities by increasing marketing efficiency and expanding exports; improvement of the quality of life by controlling the pollution of air, soil, and water; assistance in the development of rural America by promoting industry and new jobs; improvement of the nutritional quality of foods; and the enhancement of the health and the well-being of consumers by assuring the availability of safe, wholesome, and high-quality foods.

The 18 research units at the Center are concerned with foods, feeds, fibers, and products.

In the area of food research at the Center, for example, scientists in the cereal products area develop new and improved wheat, barley,

and rice products for domestic and export markets; investigators in feedstuffs conduct compositional and processing research to develop high-protein cereal by-products, and forage crops. Food engineers develop new and efficient processes to improve the nutritional value and safety of foods and feeds to provide a more competitive position for agricultural products in domestic and world markets.



0973X14-63-10

Geneticist examines a vine-like ancestor of the modern soybean grown from seed collected in the Orient. ARS scientists believe these ancient plants may provide new varieties with genetic resistance to disease, insects, and nematodes.

- The *U.S. Water Conservation Laboratory*, Phoenix, Ariz., directs its research toward new principles and methods for increasing water supply and water use efficiency, as well as decreasing water losses in systems involving soils, plants, and the atmosphere.

- The *U.S. Salinity Laboratory*, Riverside, Calif., conducts research on saline and alkaline soils and the many complicated interrelations affecting crop production on these soils.

- The *Snake River Conservation Research Center*, Kimberly, Idaho, carries on research to improve irrigation, maintain soil fertility, dispose of farm product wastes, and bring about efficient utilization of water on non-irrigated crops and rangeland.

- On the *University of California campus* at Davis, five major research programs of ARS are being carried out in cooperation with the University. The studies that are conducted on aquatic weed control are important to many Western States that depend on irrigation for crop production.

Research on livestock environment concerns the effects of temperature and humidity on swine and beef cattle and improved methods, equipment, and structures for raising and eviscerating turkeys.

Research on oilseeds and industrial crops production is carried on to improve the breeding of soybeans, safflower, sunflower, seedflax, and other oilseed crops. Investigations are also conducted on the pathology of fruits and cotton crops and on the improvement of rice varieties and rice production practices.

- The *National Seed Storage Laboratory*, Fort Collins, Colo., is dedicated to the preservation of germ plasm through the collection of seeds of known value. Researchers submit current and obsolete varieties, breeding lines, and genetic stocks. Once in the Laboratory, the seeds become the property of the federal government and are available to researchers in the United States.

Germination tests are run on incoming seeds. The crop characteristics of the seeds stored are recorded and, through the use of a computer program, can be quickly located to meet requests. Periodically, seeds are tested for germination and stocks are replaced if deterioration occurs.

In addition to the preservation of germ plasm, research work related to seed longevity is carried out. The Laboratory provides back-up storage for the working stocks in the four Regional Plant Introduction Stations as well as the working stocks in world collection.

FOREIGN RESEARCH AND TECHNICAL PROGRAMS

Under Public Law 480 and related legislation, foreign research contracts and grant programs are administered for USDA by the International Programs Division, ARS. Activities in international economic, technical, and cooperative assistance are also coordinated. Included under this legislation is the training of foreign agriculturists in this country.

Research grants are made to foreign governments and scientific organizations for research on developing new and extended uses of U.S. agricultural products, and for conducting farm, forestry, human nutrition, and market research.

This program has contributed to the development and improvement of foreign markets for U.S. agricultural products, which now represent the production from a fourth of our cropland, and it has made a solid contribution to alleviation of the balance of payments problem.

There are eleven U.S. scientists based overseas in France, Italy, the Netherlands, El Salvador, Japan, and Kenya conducting research on exotic animal diseases, insect and weed control, and problems associated with transporting and distributing commodities during export. Also, there is one scientist each in Pakistan and

Thailand to assist in finding substitute agricultural crops to replace the production of narcotics plants.

ARS Administrative Organization

The administrator, associate administrator, assistant administrators, and deputy administrator for administrative management, are located in Washington, D.C. Deputy administrators are located in their Regional headquarters. (See Regional Organization map.) The following administrative breakdown shows areas of responsibilities.

Administrator.—T. W. Edminster

Associate Administrator.—R. J. McCracken

Deputy Administrator, Northeastern Region.

—S. C. King

Deputy Administrator, North Central Region.

—E. R. Glover

Deputy Administrator, Southern Region.—A.

W. Cooper

Deputy Administrator, Western Region.—
(Vacant)

Deputy Administrator, Administrative Management.—G. F. Sedgwick

Assistant Administrator, Livestock and Veterinary Sciences.—T. B. Kinney, Jr.

Assistant Administrator, Marketing, Nutrition, and Engineering Sciences.—M. J. Palansch

Assistant Administrator, Plant and Entomological Sciences.—H. O. Graumann

Assistant Administrator, Soil, Water, and Air Sciences.—C. W. Carlson

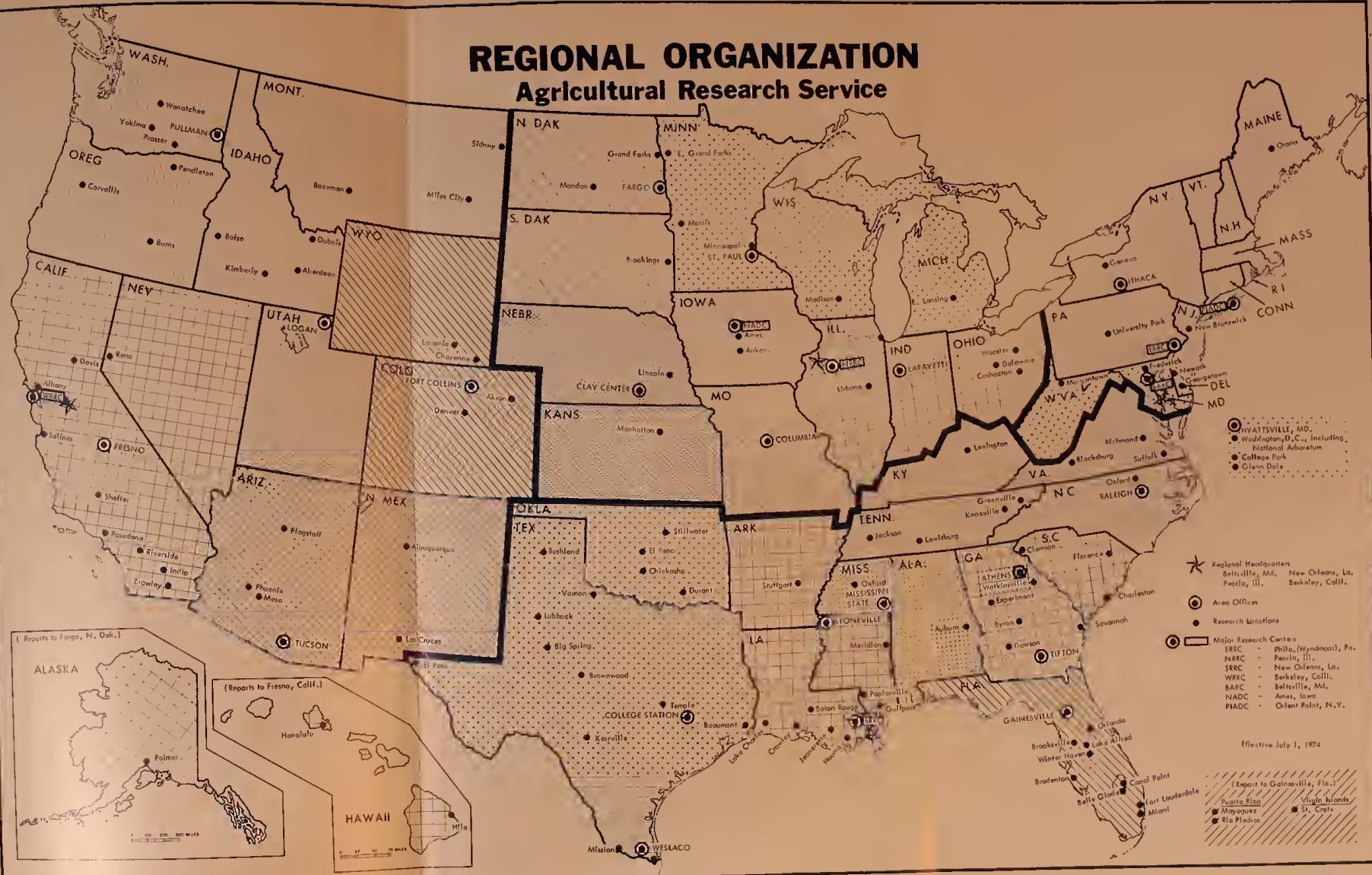
Director, Program Analysis and Coordination Staff.—E. Corley, Jr.

Director, International Programs Division.

—K. A. Haines

REGIONAL ORGANIZATION

Agricultural Research Service



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